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ABSTRACT

To study the effects over time of teacher practices concerning parent involvement on student achievement test scores, longitudinal data from 293 students (in Baltimore, Maryland, Grades 3 and 5) who took the California Achievement Test in the fall and spring of the 1980-81 school year, were analyzed. The students were in the classrooms of 14 teachers who ranged in their emphasis from confirmed leaders to infrequent users to non-users of parent involvement in learning activities at home. Results show that, from the fall to the spring, students whose teachers were leaders in the use of parent involvement made greater gains in reading achievement than did other students. However, there were no effects on math achievement for students whose teachers involved parents. These results are the first to link particular teaching practices concerning parent involvement to the actual responses of the parents and the change in achievement of their children. Apparently, important consequences can occur when teachers make parent involvement in learning activities at home part of their regular teaching practice. (KH)

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EFFECTS OF TEACHER PRACTICES OF PARENT INVOLVEMENT
CHANGE IN STUDENT ACHIEVEMENT IN READING AND MATH

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Abstract

This paper uses longitudinal data from 293 third and fifth grade stu-
dents in Baltimore City who took the California Achievement Test (CAT)
in the fall and spring of the 1980-81 school year. The students were in
the classrooms of 14 teachers who ranged in their emphasis on parent
involvement from confirmed leaders (confirmed by the principal for fre-
quent use of home-learning activities) to infrequent users to confirmed
non-leaders or non-users of parent involvement in learning activities at
home. With the data available on parent, student, and teacher charac-
teristics and practices, we take a hard look at the effects over time of
teacher practices of parent involvement on student achievement test
scores.

Results show that from the fall to the spring, students whose teach-
ers were leaders in the use of parent involvement made greater gains in
reading achievement than did other students whose teachers were not
recognized for their parent involvement practices. In these analyses,
we controlled statistically for students' initial (fall) scores, the
overall quality of the teacher in other teaching skills, parent educa-
tion, student homework practices, and parents' responses to the teach-
ers' efforts to communicate with the family. There were no effects on
change in math achievement of teacher practices of parent involvement.

Results are discussed in terms of the prevalence of teacher use of
reading activities in their parent involvement practices. These results
are the first to link particular teaching practices in parent involve-
ment to the actual responses of the parents and the change in achievement
of their children. They suggest that important consequences can occur
when teachers make parent involvement in learning activities at home
part of their regular teaching practice.

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EFFECTS OF TEACHER PRACTICES OF PARENT INVOLVEMENT ON
CHANGE IN STUDENT ACHIEVEMENT IN READING AND MATH

Introduction

For nearly two decades, social science research on school and family environments has documented the importance for student development and achievement of family conditions and practices that exemplify parental "involvement in school" (Coleman et al., 1966; Clausen, 1966; Mayeske, 1973; McDill and Rigsby, 1973; Leichter, 1974; Marjoribanks, 1979; Epstein, 1983, and other published and unpublished reports in Gordon, 1979; Henderson, 1981; Sinclair, 1980). The evidence is consistent that parents' encouragement, activities and interest at home, and their participation in schools and classrooms affect their children's achievement, even after the students' ability and family socioeconomic status is taken into account. Students gain an edge in personal and academic development if their families place an emphasis on schooling, let their children know they do, and do so continually over the school years. However, not all families know how to get involved in school-related activities in ways that will help their children improve their academic skills. A logical question is: What would happen if schools took responsibility to engage all parents--not just those who are naturally supportive and involved--to participate in the learning activities of the children at home? Are there measurable effects on students from teacher's practices of parent involvement?

There are programs in many states that explore home-school cooperation to improve students' academic skills and attitudes, or parents'

attitudes. These include the Selah, Washington's "Family-Centered Math Project;" Yakima, Washington's implementation of a parent-oriented Follow-Through Model; Detroit's "Home Curriculum Program;" Date County's "Parents Can Be Tutors; Arlington, Virginia's "Home-Based Skills Program" and others. (See the 28 programs described in Collins, Moles, and Cross, 1982).

Few studies, however, have been conducted with systematic data on the effects of these programs on the students. Tidwell (1980) describes some positive effects on parents, although the data to evaluate Los Angeles's "Project AHEAD" were admittedly poor. Gotts (1980) reports small effects on "adaptability to school" for children in family-school preschool programs. The Families as Educators program (Rich and Jones, 1977) reported that extra learning time at home produced gains in students' reading scores equivalent to those made by students under more expensive "pull-out" programs in schools.

Several Follow-Through models emphasized parent involvement at school and at home (Rivlin and Timpane, 1975), but in all cases the effects of the parent involvement components were poorly measured because there was no way to link the teachers with their own students and parents. The most reliable data from these studies appear to be estimates of effects on parents' attitudes. (See the exchange in the Harvard Educational Review, Anderson, et al. 1978; Hodges, 1978; Wisler, et al., 1978). Other studies and commentaries suggest that direct contact of parents with their own children on learning activities at home (as opposed to the contact of a few parents in the school building) should have the

most important consequences for student achievement or other outcomes such as school attendance, classroom behavior, and parent-teacher relations (Gillum, 1977; Rich, VanDien, and Mattox, 1979; Comer, 1980; Baltimore Sun, 1981). Gordon (1979) reports evidence from several studies and unpublished dissertations suggesting that there are generally positive effects of the programs on parents and on young children, but the measures of parent involvement in these studies are incomplete. Few studies look at upper elementary school or older students. Overall, there is little "hard" data that addresses the question of whether parent involvement programs directly influence student achievement (Olmsted et al, 1982).

As part of an on-going study of the effects of teacher practices of parent involvement, we can study the effects -- over time -- of teacher practices of parent involvement on gains in reading and math achievement test scores.

Data and Approach

This paper uses longitudinal data from 293 third and fifth grade students in Baltimore City who took the California Achievement Test (CAT) in the fall and spring of the 1980-81 school year. The students were in the classrooms of 14 teachers who ranged in their emphasis on parent involvement from confirmed leaders (confirmed by the principal for frequent use of home-learning activities) to infrequent users to confirmed non-leaders or non-users of parent involvement in learning activities at home. The students' parents were surveyed about their reactions to and experiences with teacher practices of parent involvement (Epstein, 1983,

1984a,b). The data permit the direct linking of teacher practices to the families and to the students in the teachers' classrooms.

With linked data we can ask what are the consequences--as distinct from the correlates--of teachers' uses of instructional strategies that emphasize parent involvement at home? We can determine whether students made greater gains in reading and math achievement if their teachers emphasized parent involvement techniques. Multiple regression analysis is used to identify the independent and important effects on change in student achievement.

In the analyses, several types of variables that theoretically could influence change in achievement scores are studied: student and family background (sex, race and grade level of student, parent education, initial achievement), teachers' characteristics and practices (overall teaching quality, years of experience, and leadership in parent involvement), parent reactions (responses to teacher requests for involvement, and estimates of the quality of homework assigned by the teacher), and student effort (the quality of homework completed as rated by the teacher). These measures are examined for their influence on change in reading and math scores over one school year. We are especially interested in whether teacher practices of parent involvement affect change in reading and math achievement, net of the other potentially influential variables.

Results

Effects on change in reading achievement. Table 1 presents the significant effects on the change in reading achievement scores. In this analysis, variables were entered in four steps to illustrate the type, magnitude, and persistence of their influences on change in reading achievement. Line 1 of the table shows the effects of fall (or Time 1) characteristics of students and teachers -- the students' initial reading scores and the overall quality of the teacher as rated by the principal. These two variables significantly influence change in reading achievement. Students with lower reading scores in the fall make more positive change by the spring than do other students ($b = -.259$). This effect is partly a "regression to the mean," but also is partly a consequence of the "room-to-change" rule. Students who are initially low improve more because there is room for their test scores to change, and, we assume because they, their teachers and their families are working to improve learning. The positive effect of teacher quality shows that good teachers -- significantly more than poor teachers -- influence greater gains in reading achievement scores ($b = .157$). These two variables maintain their independent, significant influence on change in reading scores, even after the other measures of teacher practices, parent responses and student effort are entered in the model.

Table 1 About Here

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Table 1

What factors influence change in reading achievement test scores from fall to spring? ^{a/h/}

EFFECTS ON CHANGE SCORES IN READING OF:							
VARIABLES ADDED	Initial Reading Score (Fall)	Overall Quality of Teacher	Leadership in Parent Involvement	Parent Education	Parent Knows More This Year Than Before	Student Homework Quality	R ²
Student and Teacher (Starting) Characteristics	-.259	.157					.105
Teacher Leadership in Parent Involvement at Home	-.243	.201	.193				.141
Parent Resources and Response to Involvement	-.275	.164	.171	.185	.153		.185
Homework Completion Quality	-.330	.138	.128	.162	.122	.193	.216
(Zero-order correlation)	(-.285)	(.200)	(.162)	(.092)	(.191)	(.186)	

^{a/} Achievement test scores are fall and spring scores (percentiles) on the Reading Subtest of the California Achievement tests for 293 third and fifth grade students.

^{b/} Standardized regression coefficients are reported.

In this table, all unstandardized coefficients are twice their standard errors.

Line 2 of the table shows that, net of initial reading achievement and overall teaching quality, teacher leadership in parent involvement in learning activities at home positively and significantly influences change in reading achievement. Teacher leadership in parent involvement practices is the variable of major interest in this study. This variable remains a significant influence on change in reading achievement even after other variables are added to the model.

The third line of the table adds two measures of parent resources and response that influence change in reading achievement. Parents with more education and parents who report that they have learned more this year than previously about their child's instructional program, positively influence change in the reading achievement of their children. Knowing more about the school program is one of the clear effects on parents of teacher practices of parent involvement (Epstein 1983b, 1984a,b. Thus, the measures in lines 2 and 3 suggest that two types of parents influence positive growth in reading achievement -- parents who are expected to help their children (those with more education) and parents who are helped to help their children (those whose children's teachers involve them in learning activities and increase their knowledge about the school program). Teachers rated students as homework stars, homework problems, or as neither stars nor problems. We see in line 4 of the table that, net of all other variables, students who are homework stars -- who complete their homework well -- { gain more in reading achievement than do other students.

Each set of variables in Table 1 adds significantly to the power of the model to explain the change in reading achievement test scores. After the initial scores and teacher quality are entered, teacher leadership in parent involvement, parent resources, and student homework quality add 4%, 4%, and 3%, respectively, to the explained variance in change in reading scores. The measure of major interest is the effect of teacher practices of parent involvement on student achievement. We see that for reading achievement, teacher leadership in parent involvement contributes to positive change in reading achievement from fall to spring.

Effects on change in math achievement. Table 2 tells a different story about change in math achievement scores. Line 1 of table 2 shows that students make more positive change in math achievement if they start with lower scores in the fall, if the teacher is a newer teacher (with fewer years of teaching experience), and if they are in the younger grades (i.e. grade three rather than grade 5). The overall quality of the teacher, as rated by the principal, does not influence change in math scores. As with change in reading scores, students with more room-to-change do so -- those low in the fall change more in the positive direction by spring.

Table 2 About Here

Line 2 of table 2 shows that the teacher's leadership in the use of parent involvement is not an important influence on change in math

Table 2

What factors influence change in math achievement
test scores from fall to spring? a/b/

EFFECTS ON CHANGE SCORES IN MATH OF:							
VARIABLES ADDED	Initial Math Score (Fall)	Overall Quality of Teachers	Years of Teaching Experience	Grade Level	Leadership in Parent Involvement	Homework not Busy Work	R ²
Student and Teacher (Starting) Characteristics	-.349*	-.038	-.152*	-.266*			.253
Teacher Leadership in Parent Involvement at Home	-.348*	-.047	-.148*	-.277*	-.028		.254
Assigned Homework Quality	-.334*	-.047	-.146*	-.258*	-.025	.104#	.264
(Zero-order correlation)	(-.428)	(.131)	(-.151)	(-.326)	(.040)	(.216)	

a/ Achievement test scores are Fall and Spring scores (percentiles) on the mathematics subtest of the California Achievement Tests for 293 third and fifth grade students.

b/ Standardized regression coefficients are reported.

* Indicates unstandardized coefficient is at least twice its standard error. #Indicates coefficient is approaching twice its standard error.

scores. The last line of the table suggests that the practice of assigning purposeful homework (not busy work) has a small, positive effect on change in math achievement.

The results in table 2 do not contribute to an argument for or against the use of parent involvement in learning activities at home to improve math skills. The data show that teacher practices of parent involvement are not significant positive or negative influences on change in math achievement.

Comparing effects on change in reading and math scores. Table 3 compares effects on changes in reading and math achievement using a common model that incorporates variables from tables 1 and 2, and other standard variables in studies of school and family effects. The table presents the effects of the variables, independent of all other variables in the model.

The top section of the table focuses attention on the student and family background measures. As in the earlier tables, we see that initial (fall) scores influence change in reading and math scores -- students who initially have low scores change more positively from fall to spring. Neither sex nor race of students influence change scores in either subject. Parent education and grade level are important independent influences, but on different subjects. Better-educated parents influence positive change in reading scores, but not math. Younger students (in grade 3) make greater gains in math than do students in grade 5, but grade level is not an important influence on gains in reading achievement.

 Table 3 About Here

The middle section of the table presents the variables in the model that concern the teachers' background. The two variables have important independent effects, but on different subjects. Overall teacher quality -- the reputational index based on principals' ratings of four classroom instruction and management skills -- influences change in reading scores but not math. Fewer years of teaching experience influences positive change in math scores, but has no effect on change in reading scores.

The bottom section of table 3 focuses on two measures of home learning activities. Teacher leadership in the use of parent involvement in learning activities at home has a positive influence on change in reading scores, but not math. Teacher assignment of purposeful homework influences positive change in math scores, not reading.

Discussion

Why should changes in reading and math achievement test scores be influenced by different variables? We have some clues about that from other data collected from the teachers and parents in this study. For example, teachers report that reading activities are their most frequent and most satisfying parent involvement practices (Becker and Epstein, 1982). Parents report that they have most experience with and receive most requests for assistance on reading activities at home (Epstein, 1985b). It appears that this emphasis on reading -- the most used

Table 3

What can we learn by comparing the effects of a common model student and family background, teacher characteristics, and teacher practices of parent involvement on change in reading and math scores?^{a/}

TYPE OF VARIABLES	MEASURES	CHANGE IN READING ACHIEVEMENT		CHANGE IN MATH ACHIEVEMENT	
		b	(r)	b	(r)
STUDENT AND FAMILY BACKGROUND	. Sex	.048	(.022)	.009	(.050)
	. Grade Level	-.053	(-.222)	-.247*	(-.326)
	. Parent Education	.110*	(.092)	.067	(-.024)
	. Race	.068	(-.004)	.088	(.022)
	. Fall Score ^{b/}	-.294*	(-.285)	-.357*	(-.427)
TEACHER SKILLS AND EXPERIENCE	. Overall Quality of Teacher	.175*	(.200)	-.033	(.131)
	. Years of Teaching Experience	-.004	(-.026)	-.152*	(-.151)
HOME LEARNING ACTIVITIES	. Teacher Leadership in Parent Involvement	.144*	(.162)	-.037	(.040)
	. Homework not Busy Work	.028	(.072)	.109*	(.216)
	R ²	.173		.274	

^{a/} (b) = standardized regression coefficients. (r) = zero-order correlations.

^{b/} Fall score is the initial reading score in the analysis of change in reading achievement, and the initial math score in the analysis of change in math achievement.

parent involvement practice -- has real consequences on change in students' reading achievement.

We learned from earlier reports from parents that more parents of fifth grade students felt they did not have the training needed to help their child with reading and math skills at home. feeling of ability to help was more common for parents of younger The analyses of change in achievement suggest that the parents' lack of know-how may be more true for math than for reading activities. The results suggest that teachers may need to give more attention to helping parents of older children learn how to help their children in math at home.

There was more "room for change" in students' reading than math scores:

		City Fall 1980	City Spring 1981	Full Sample Fall 1980
Reading Achievement	$\bar{x}$	38.60	50.69	50.45
	sd	(25.51)	(25.20)	(28.43)
Math Achievement	$\bar{x}$	43.75	57.46	52.38
	sd	(25.70)	(24.74)	(26.99)

There was dramatic improvement in reading and math scores for the city students from fall to spring, but the more dramatic change was in reading scores. The results reported in Table 1 suggest that the change in reading achievement was influenced sharply by several sources: teacher, parent, and student characteristics and practices, including

teacher leadership in the use of parent involvement in learning activities -- especially reading activities -- at home.

Change in math achievement may have more to do with current methods of teaching math and with the assignment of purposeful homework assignments. Newer teachers (here, those with fewer years of teaching experience) may be more responsive to recent pressures to increase the emphasis on math in the elementary grades.

Earlier studies have reported that school effects are stronger for math achievement than for language achievement (Coleman, et al; McDill and Rigsby, 1973). Here we see that there may be other important factors that explain why families seem to influence their children's language or reading scores. Some teachers help families help their children by using frequent parent involvement practices that involve reading skills, listening to the child read, reading aloud together, borrowing books to use at home, etc. Thus, families have more effects on achievements that teachers help them influence -- such as reading. The school may appear to have greater impact on skills that they do not ask the family to assist with -- such as math. In the end, these are both kinds of "school effects" because the school is helping the family build students' skills.

The analyses show that more educated parents do affect their child's growth in reading skills. These would be the parents who always have been involved with their children's education. But, more importantly, net of parent education, teacher practices of parent involvement help families become involved who typically would not be involved in the

child's instruction at home. The leadership of the teacher in parent involvement influences positive change in student reading scores.

For some teachers, the "bottom line" for decisions about the use parent involvement practices rests with the documentation of effects on students. Although there are clear measurable effects on parents' awareness and understanding about school as a result of teacher practices of parent involvement (Epstein, 1983), many teachers will not choose to use parent involvement techniques unless they are shown to help students who need extra help. In this study we show that there are persistent, significant effects on change in reading achievement from fall to spring for children in the classrooms of teachers who are leaders in the use of parent involvement practices. Additional studies that collect longitudinal achievement test scores, specific measures of teacher practices of parent involvement, and data from parents on their responses to teachers' requests are needed to check the results of this first study.

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